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EP 0,899,325 A2
[Claims only, as requested]

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NL, PT, SE

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SOFTENER COMPOSITION

Applicant: Ciba Specialty Chemicals Holding Inc.
4057 Basel (CH)

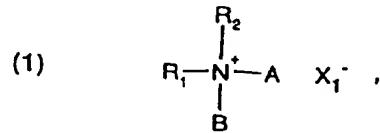
Inventors: Alfred Höhener
4312 Magden (CH)

Roland Frick
68480 Durmenach (FR)

* * *

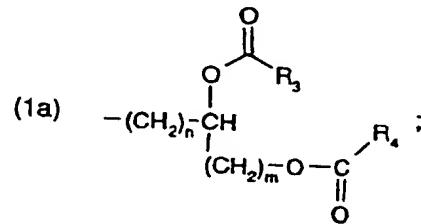
Claims

1. A softener composition containing
 - (a) a water-soluble Zn, Fe(II), Ca, Mg, Na, K, Al, Si(IV), P(V), Ti(IV), Ge(IV), Cr(VI), Ga(III), Zr(IV), In(III), Sn(IV) or Hf(VI) phthalocyanine; and
 - (b) a quaternary ammonium compound of the formula

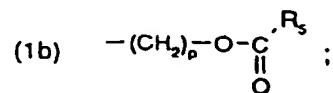


where

R_1 and R_2 , independent of one another, mean C_1-C_5 alkyl; or hydroxy- C_1-C_5 alkyl; A means a residue of the formula



or a residue of the formula



B means a C_1-C_5 alkyl, a C_8C_{20} fatty acid residue; the residue of formula (1a) or of the residue of formula (1b);

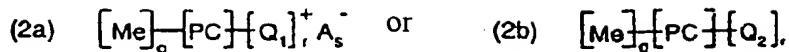
R_3 , R_4 and R_5 , independent of one another, mean a C_8-C_{20} fatty acid residue;

X_1^- means an anion that is compatible for softeners;

and

m , n and p mean a number from 0 to 5.

2. A composition as in Claim 1, which is characterized by the fact that it contains a phthalocyanine of the formula



where

PC means the phthalocyanine ring system;

Me means Zn, Fe(II), Ca, Mg, Na, K, Al-Z₁, Si(IV), P(V), Ti(IV), Ge(IV), Cr(VI), Ga(III), Zr(IV), In(III), Sn(IV) or Hf(VI);

Z₁ means a halide, sulfate, nitrate, acetate, alcoholate, carboxylate or hydroxyl ion;

q means 0, 1 or 2;

r means 1 to 4,

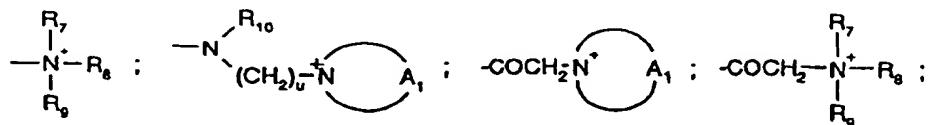
Q₁ means a sulfo or carboxyl group; or a residue of the formula $-SO_2X_2-R_6-X_3^+$, $-O-R_5-$ X₃⁺ or $-(CH_2)_tY_1^+$;

where

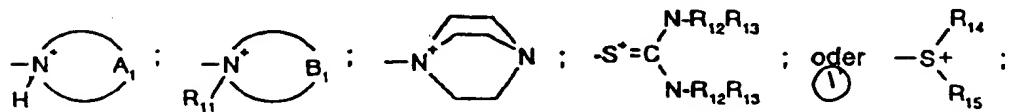
R₆ means a branched or unbranched C₁-C₈ alkylene; or 1,3- or 1,4-phenylene;

X₂ means $-NH-$; or $-N-C_1-C_5$ alkyl;

X₃ means a group of the formula

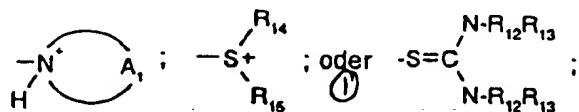


for the case that R₆ = C₁-C₈ alkylene, also a group of the formula



Key: 1 or

Y₁⁺ means a group of the formula



Key: 1 or

t means 0 or 1;

where in the above formulas

R₇ and R₈, independent of one another, mean C₁-C₆ alkyl;

R₉ means C₁-C₆ alkyl; C₅-C₇ cycloalkyl; or NR₁₁R₁₂;

R₁₀ and R₁₁, independent of one another, mean C₁-C₅ alkyl;

R₁₂ and R₁₃, independent of one another, mean hydrogen or C₁-C₅ alkyl;

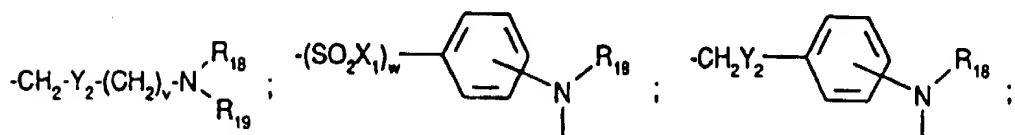
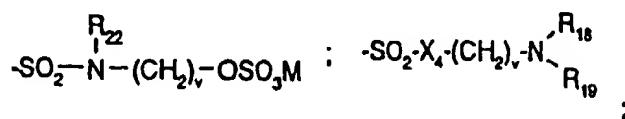
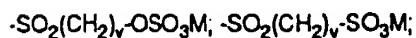
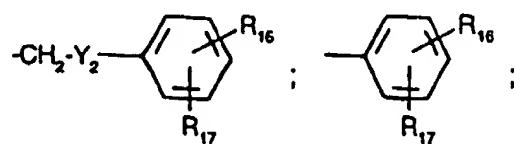
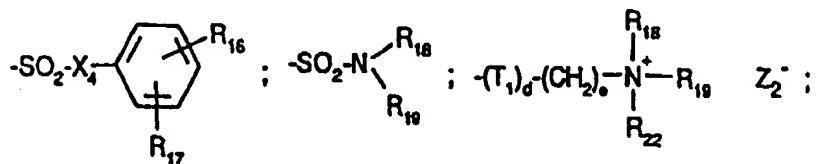
R₁₄ and R₁₅, independent of one another, mean C₁-C₆ alkyl that is not substituted or is substituted by hydroxy, cyano, carboxy, carb-C₁-C₆-alkoxy, C₁-C₆ alkoxy, phenyl, naphthyl or pyridyl;

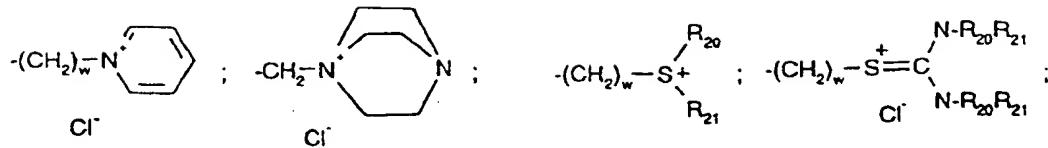
u means 1 to 6;

A₁ means the complement to an aromatic 5- to 7-member nitrogen heterocycle, which optionally can still contain one or two other nitrogen atoms as ring members, and

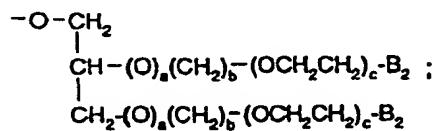
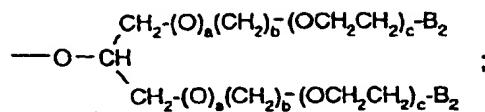
B₁ is the complement to a saturated 5- to 7-member nitrogen heterocycle, which can optionally still contain 1 to 2 nitrogen, oxygen and/or sulfur atoms as ring members;

Q₂ means hydroxy; C₁-C₂₂ alkyl; branched C₄-C₂₂ alkyl; C₂-C₂₂ alkenyl; branched C₄-C₂₂ alkenyl and mixtures thereof; C₁-C₂₂ alkoxy; a sulfo or carboxyl residue; a residue of the formula





a branched alkoxy residue of the formula



an alkylethyleneoxy unit of the formula

$-(T_1)_d-(CH_2)_b(OCH_2CH_2)_a-B_3$ or an ester of the formula COOR₂₃

where

B₂ means hydrogen; hydroxy; C₁-C₃₀ alkyl; C₁-C₃₀ alkoxy; -CO₂H; -CH₂COPOH; SO₃⁻M₁⁺; -OSO₃⁻M₁⁺; -PO₃²⁻; M₁; -OPO₃²⁻M₁; and mixtures thereof;

B₃ means hydrogen; hydroxy; -COOH; -SO₃⁻M₁⁺; -OSO₃⁻M₁⁺; C₁-C₆ alkoxy;

M₁ means a water-soluble cation;

T₁ means -O- or NH;

X₁ and X₄, independent of one another, mean -O-, -NH-, or -N-C₁-C₅-alkyl;

R₁₆ and R₁₇, independent of one another, mean hydrogen, the sulfo group and its salts, the carboxyl group and its salts or the hydroxyl group, where at least one of the residues R₁₆ and R₁₇ stands for a sulfo or carboxyl group or its salts,

Y₂ means -O-, -S-, -NH- or -N-C₁-C₅-alkyl;

R₁₈ and R₁₉, independent of one another, mean hydrogen, C₁-C₆ alkyl, hydroxy-C₁-C₆ alkyl, cyano-C₁-C₆ alkyl, sulfo-C₁-C₆ alkyl, carboxy or halo-C₁-C₆ alkyl; phenyl that is not substituted or is substituted by halogen, C₁-C₄ alkyl or C₁-C₄ alkoxy, sulfo or carboxy; or R₁₈ and R₁₉ together with the nitrogen to which they are bonded form a saturated 5- or 6-member heterocyclic ring, which additionally can contain another nitrogen or oxygen atom as a ring member;

R₂₀ and R₂₁, independent of one another, mean a C₁-C₆ alkyl or aryl-C₁-C₆ alkyl residue;

R_{22} means hydrogen; or C_1 - C_6 alkyl that is not substituted or is substituted by halogen, hydroxy, cyano, phenyl, carboxy, carb- C_1 - C_6 alkoxy or C_1 - C_6 alkoxy;

R_{23} means C_1 - C_{22} alkyl, branched C_4 - C_{22} alkyl, C_1 - C_{22} alkenyl or branched C_4 - C_{22} alkenyl; C_3 - C_{22} glycol; C_1 - C_{22} alkoxy; branched C_4 - C_{22} alkoxy; and mixtures thereof;

M means hydrogen; or an alkali metal or ammonium ion;

Z_2 means a chlorine, bromine, alkyl or aralkyl sulfate ion;

a means 0 or 1;

b means 0 to 6;

c means 0 to 100;

d means 0 or 1;

e means 0 to 22;

v means a whole number from 2 to 12;

w means 0 or 1; and

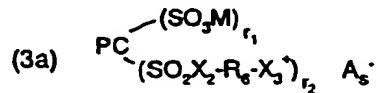
A means an organic or inorganic anion

and

s is equal to r in the case of monovalent anions A^- and is $\leq r$ in the case of polyvalent anions, where A_s^- must compensate the positive charge; where, if $r \neq 1$; the residues Q_1 can be the same or different,

and where the phthalocyanine ring system can also contain other solubilizing groups.

3. A composition as in Claim 1 or 2, which is characterized by the fact that it contains a phthalocyanine of the formula



where

PC , X_2 , X_3 , R_6 have the meaning given in Claim 2;

M means hydrogen, an alkali metal, ammonium or amine salt ion;

and the sum of the numbers r_1 and r_2 is from 1 to 4 and

A_s^- exactly compensates the positive charge of the remaining molecule.

4. A composition as in Claim 1 or 2, which is characterized by the fact that it contains a phthalocyanine of the formula



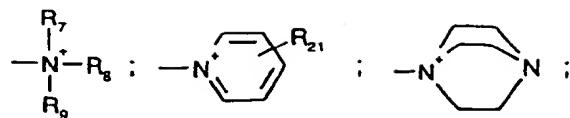
where

PC is as defined in Claim 2,

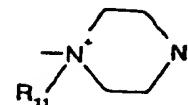
R_6' is C_2 - C_6 alkylene;

r_1 is a number from 1 to 4;

X_3 means



or



where

R_7 and R_8 , independent of one another, mean C_1 - C_4 alkyl that is unsubstituted or is substituted by hydroxy, cyano, halogen or phenyl;

R_9 means R_7 ; cyclohexyl or amino;

R_{11} means C_1 - C_4 alkyl;

R_{21} means C_1 - C_4 alkyl; C_1 - C_4 alkoxy; halogen, carboxy, carb- C_1 - C_4 alkoxy or hydroxy;
and

A' is a halide, alkyl sulfate or aryl sulfate ion;

where the residues $-SO_2NHR'_6-X_3^+A^-$ can be the same or different.

5. A composition as in Claim 1 or 2, which is characterized by the fact that the composition contains phthalocyanines of the formula



where

PC means the phthalocyanine ring system;

Me means Zn, Fe(II), Ca, Mg, Na, K, Al-Z₁, Si(IV), P(V), Ti(IV), Ge(IV), Cr(VI), Ga(III), Zr(IV), In(III), Sn(IV) or Hf(VI);

Z₁ means a halide, sulfate, nitrate, acetate, alcoholate, carboxylate or hydroxy ion;

q means 0, 1 or 2,

Y_3' means hydrogen, an alkali metal or ammonium ion; and

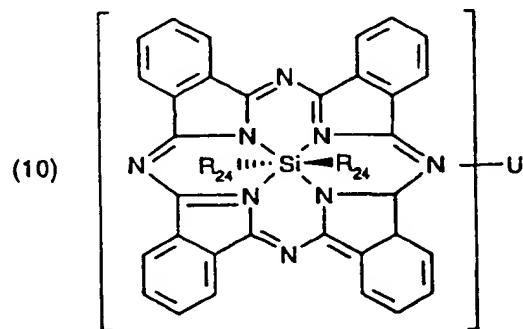
r is any number from 1 to 4.

6. A composition as in Claim 5, which is characterized by the fact that in formula (5)

Me means Zn or Al-Z₁; and

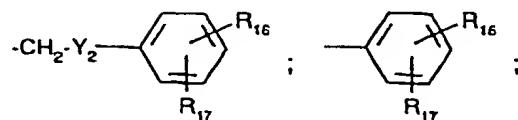
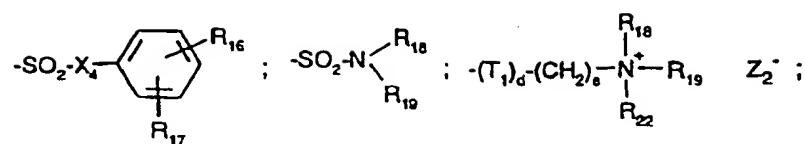
Z₁ means a halide, sulfate, nitrate, acetate, alcoholate, carboxylate or hydroxy ion.

7. A composition as in Claim 1, 2 or 5, which is characterized by the fact that the composition contains a phthalocyanine of the formula

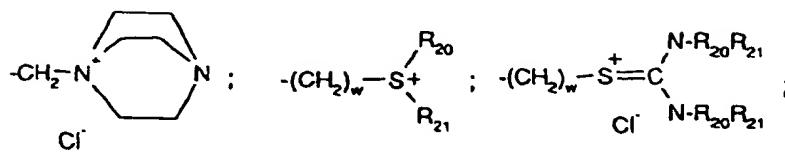
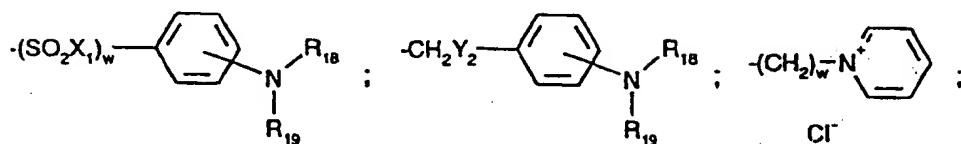
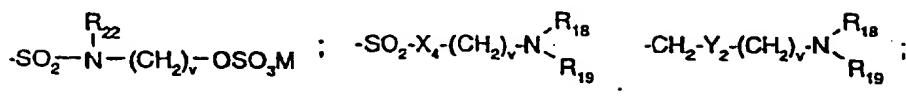


where

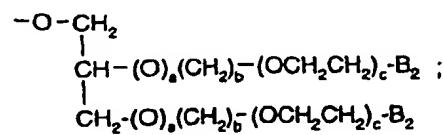
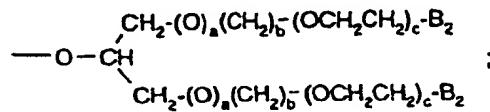
R₂₄ means hydroxy; C₁-C₂₂ alkyl; branched C₄-C₂₂ alkyl; C₁-C₂₂ alkenyl; branched C₄-C₂₂ alkenyl and mixtures thereof; C₁-C₂₂ alkoxy; a sulfo or carboxyl residue; a residue of the formula



$\text{-SO}_2(\text{CH}_2)_v\text{-OSO}_3\text{M}$; $\text{-SO}_2(\text{CH}_2)_v\text{-SO}_3\text{M}$;



a branched alkoxy of the formula



an alkylethyleneoxy unit of the formula

$-(T_1)_d-(CH_2)_b(OCH_2CH_2)_c-B_3$ or an ester of the formula $COOR_{23}$; and
 U means $[Q_1]R^+A_s^-$; or Q_2 ; and

$R_{16}, R_{17}, R_{18}, R_{19}, R_{20}, R_{21}, R_{22}, R_{23}, B_2, B_3, M, M_1, Q_1, Q_2, A_s, T_1, X_1, Y_2, Z_2'$, a, b, c, d, e, r, v , and w have the meaning given in formulas (2a) and (2b).

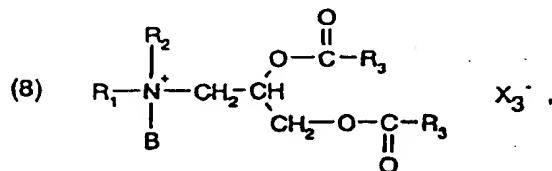
8. A composition as in one of Claims 1 to 7, which is characterized by the fact that the quaternary ammonium compound corresponds to formula (1), where

X_1 means a halogen atom; $-CH_3SO_4^-$, $-C_2H_5SO_4^-$ or $-NO_3^-$.

9. A composition as in one of Claims 1 to 8, which is characterized by the fact that in formula (1) A and B, independent of one another, mean the residue of formula (1a) or (1b).

10. A composition as in Claim 9, which is characterized by the fact that A and B mean the residue of formula (1b).

11. A composition as in one of Claims 1 to 7, which is characterized by the fact that the quaternary ammonium compound corresponds to the formula



where

R_1, R_2 and B mean C_1-C_5 alkyl;

R_3 means the aliphatic residue of a tallow fatty acid; and

X_3^- means a halogen atom.

12. A composition as in Claim 1, containing

- (a) a water-soluble phthalocyanine of formula (5) as in Claim 5, and
- (b) a quaternary ammonium compound of formula (8) as in Claim 11.

13. A composition as in Claim 1, containing

- (a) a water-soluble phthalocyanine of formula (10) as in Claim 7, and
- (b) a quaternary ammonium compound of formula (8) as in Claim 11.

14. A composition as in Claim 1, which is characterized by the fact that it contains 0.0001 to 0.05% by weight of component (a) and

1 to 20% by weight of component (b).

15. A method for bleaching textile fiber materials with a photobleaching agent, which is characterized by the fact that soiled textiles are treated in a bath [that contains] the softener composition, containing

- (a) a water-soluble $Zn, Fe(II), Ca, Mg, Na, K, Al, Si(IV), P(V), Ti(IV), Ge(IV), Cr(VI), Ga(III), Zr(IV), In(III), Sn(IV)$ or $Hf(VI)$ phthalocyanine; and

(b) a quaternary ammonium compound of formula (1),
with irradiation with visible and/or infrared light or in daylight and in the presence of
oxygen, where either the softener bath is irradiated directly or the wet textiles are irradiated
outside of the softener bath.